

National Aeronautics and Space Administration



# Roundup

LYNDON B. JOHNSON SPACE CENTER

June | 2011



Research out of this world

# JSC Director



## On the cover:

***The International Space Station is an engineering marvel with more livable room than a conventional five-bedroom house. Its laboratories are kept busy with numerous, ongoing scientific experiments.***



NASA/HARNETT JSC2011E030234

## Photo of the month:

***Hurricane season starts June 1. Are you ready? Keep your 2011 Johnson Space Center Hurricane Prep Kit handy for everything you need to know about storm preparedness for this season.***

**I have** a personal request: Please observe the ban against using cell phones while driving at Johnson Space Center. I admit, it's a pet peeve of mine. Over the holidays, I was hit from behind by a driver talking on a cell phone. Even though the driver's car was demolished and the airbag had deployed, the driver continued talking on a cell phone until a policeman asked him repeatedly to put the phone down and answer the questions. Turns out that the driver was in a rental car since the driver's own car was still in the body shop from a previous collision—which occurred while talking on a cell phone.

While the state of Texas does not prohibit talking on a cell phone while driving, nine other states and the District of Columbia have laws against cell phone use while driving, and 31 states and Washington, D.C., prohibit texting while driving. Research published in the *British Medical Journal* shows that you are four times more likely to be involved in an accident if you talk on a cell phone while driving.

The speed limits at JSC are meant to reduce the likelihood of severe injuries, but we still have a number of accidents every year. We have numerous crosswalks full of pedestrians, and distracted drivers are dangerous. Again, please observe the ban against cell phone use while driving at JSC. Let's watch out for each other.

Thank you!



NASA PHOTO

*Mike*

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# Innovation 2011

## A new era of collaboration



By Catherine E. Williams

NASA/SOWA JSC2011E040871



NASA/BLAIR JSC2011E040866



NASA/SOWA JSC2011E040929

Innovation at JSC is ongoing. Look in JSC Today for events like rap forums and featured speakers of interest to the JSC community. Participate and reach out ... be a part of the inclusion and innovation that makes JSC such a dynamic place to work.

And, if you want to take a gander at Yammer, be sure to check out the Social Media Guidelines and other tips first: <http://ird.jsc.nasa.gov/PolicyPlanning/socialmedia/default.aspx>



### Innovation 2011 on May 4 sparked the imaginations of the JSC workforce.

It was Johnson Space Center's second time hosting a day devoted to innovation and the sharing of new ideas and fresh perspectives on May 4. Along with exhibits that overflowed in the spaces around buildings and special rap forums designed to bring collaboration to the forefront, there were some new, exciting aspects to Innovation 2011.

The advent of social media played a big part in garnering participation from employees across the center.

"We decided early on that we needed to have a social media component in Innovation 2011 if we wanted to be considered on the leading edge," said JSC Chief Technology Officer and Innovation 2011 Chair James McClellan. "Yammer was selected for a lot of reasons, and it was a big success at Innovation 2011. We added about 2,000 new Yammer accounts from the time (JSC Deputy Director) Ellen Ochoa announced it on April 15 and up to Innovation Day on May 4."

Yammer is an internal social networking tool that brings together all of the agency's employees inside a private and secure social network; in this case, everyone with a "@nasa.gov" email address is able to share ideas across the center and the agency.

"There were a lot of conversations that are still continuing after the event, which is what we hoped would occur," McClellan said. "Folks are still getting on and getting used to Yammer, and we have a bit of a learning curve to go through in honing it into the professional communication/collaboration tool it is intended to be, but you can already see the connections happening."

Yammer has the ability to reach out directly to anyone in the NASA community with a similar interest or curiosity about the topic under discussion, which makes it easier to engage team members with an inclusiveness previously not seen. However, as with all avenues of communication, with power comes responsibility. Unlike Twitter or

Facebook, Yammer is a professional tool.

"While we encourage open and frank discussions, folks need to be sure to keep it professional and remember that many eyes will see your postings," McClellan said. "If you haven't had the opportunity to read through the Social Media Guidelines and some of the other helpful tips and training we have, please check it out."

The Engineering Directorate also added a new element to Innovation 2011 with their test flight of Morpheus, a vertical test bed demonstrating new green propellant propulsion systems and autonomous landing and hazard detection technology. Designed, developed, manufactured and operated in-house by engineers at JSC, the Morpheus Project represents not only a vehicle to advance technologies, but also an opportunity to try out "lean development" engineering practices. With the current fiscal environment, JSC leaders are encouraging that kind of innovation to continue.

"Obviously, the budget is not what it was before," said Mark Geyer, manager, Multi-Purpose Crew Vehicle Program Office, during The Future of JSC Rap Forum. "How do we get the most hardware for the budget we've been given so we can fly tests and people as soon as possible? How do we get the best from NASA and industry so we can move forward? We have a lot of innovating, a lot of work to do."

If the exhibits and booths at Innovation 2011 are any indication, JSC is up for the challenge.

"The Innovation 2011 team certainly did an outstanding job, and I want to thank every member for all the work they put in over the past six months of preparation," McClellan said. "As the Inclusion and Innovation Council has said before, Innovation Day is just a day when we display the innovation and collaboration that is going on at JSC every day."

# Science beneath the sea: NEEMO 15



By Neesha Hosein

**Not** only is NASA's scientific research being conducted in space and on land, but it is also happening below the sea, namely with the NASA Extreme Environment Mission Operations (NEEMO) 15 project. In October, six aquanauts will live inside Aquarius, an underwater laboratory near Key Largo, Fla., for 10 days, performing simulated "spacewalks" from the habitat to anchor, translate, sample and deploy instruments on a virtual asteroid surface.

"Even experts don't know what the surface of an asteroid is going to be like," said NEEMO Project Manager Bill Todd. "There may be asteroids that we don't even know about yet that we'll be visiting. So we're figuring out what's the best way to do that."

## Who are the aquanauts?

The NEEMO mission is comprised of a six-person aquanaut crew of engineers and astronauts. Two members of the crew are professional aquanauts employed by National Oceanic and Atmospheric Administration/University of North Carolina Wilmington, who are experts at maintaining and running the underwater habitat.



NASA/PHOTO JSC2010E080614

Unlike the moon or Mars, an asteroid would have little, if any, gravity to hold astronauts or vehicles to its surface, so an anchor would be necessary. NEEMO 15 will evaluate different anchoring methods.

Maneuvering on an asteroid surface will require a method of connecting multiple anchors to form pathways. To figure out the best way to do so, NEEMO 15 will be asking: Is it more efficient to join the anchors in a straight line, or should the setup be more similar to the spokes of a wagon wheel?

NASA's purpose in visiting an asteroid would be to gather information about it, and methods of collection will be the third area of investigation for NEEMO.

During the preliminary tests, NASA engineers and scientists work from the ocean's floor,

**Andrew Abercromby (right) enters the ascent module mock-up, while Tom Marshburn looks on during an undersea session of extravehicular activity.**

but do not stay inside Aquarius or saturation dive, which means they can return to the surface at any time. Meanwhile, National Undersea Research Center aquanauts will be living inside Aquarius during the tests, making sure everything inside is ready for NEEMO 15.

"This allows us to adapt our concepts," Todd said.

"You can come to the surface and retool your equipment, if necessary, and spend time with your crew, making sure everything works (so) that when we come back in October, we'll have a safe and successful mission."

Follow NEEMO on Twitter: [https://twitter.com/NASA\\_NEEMO](https://twitter.com/NASA_NEEMO)



NASA/PHOTO JSC2010E077813

**Andrew Abercromby (left) and Nate Bender perform communication checks with Mission Control from inside their undersea habitat for the 14th NEEMO mission.**

## Preparing for NEEMO 15

The NEEMO 15 expedition will happen this October. Thus far, no one has ever attempted even a simulated trip to an asteroid, so there is much work to be done before the mission begins. On May 8, engineers journeyed to Aquarius to work through some of the concepts they intend to test in October.

"The analog environment of NEEMO allows us to test and further develop the hardware in an accurate, near-zero gravity environment similar to that which we will find on an asteroid or the moons of Mars," said Dr. Steven P. Chappell, research specialist for the Exploration Analogs and Mission Development Team. "Working through the procedures now will allow the mission to execute more safely, effectively and efficiently in October, not unlike training for an actual space mission."

## Research goals

NEEMO 15 will focus on three different aspects of a mission to an asteroid surface. The first is anchoring to the asteroid surface.



NASA/BLAIR JSC2011E043027

**An insider's view of Johnson Space Center's NEEMO Mission Control Center.**

# International partnership endures test of crisis



By Rachel Kraft

**When** the most powerful earthquake ever to hit Japan struck the nation in mid-March, Japan Aerospace Exploration Agency (JAXA) flight controllers at the agency's facility in Tsukuba, Japan lost communication capabilities with the International Space Station. On the orbiting lab, an experiment was taking place in the Kibo module, and astronauts were busy packing the H-II Transfer Vehicle (HTV-2) with trash.

"I was on console during the earthquake, and our space station operations building was shaking severely," said JAXA Flight Director Yoshio Toukaku, who visited Johnson Space Center during April to support operations remotely while the Tsukuba Space Center (TKSC), located approximately 40 miles northeast of Tokyo and 120 miles southwest of the Fukushima nuclear facility, underwent repairs.

Controllers in the facility during the earthquake were able to shut down the operating payload before evacuating the building to ensure that Kibo was left in a safe configuration, and communication capabilities were quickly transferred to the Mission Control Center in Houston. For about a week, while officials in Japan assessed damage, JSC monitored operations typically controlled by JAXA. The transfer of Kibo and HTV-2 monitoring was smooth.

The disaster caused little interruption to Kibo and HTV-2 operations in part because of the close relationship between JAXA and NASA. Since 1990, NASA's International Space

**Backdropped by Earth's horizon and the blackness of space, the International Space Station's Canadarm2 unberths the unpiloted Japan Aerospace Exploration Agency HTV-2, filled with trash and unneeded items, in preparation for its release from the station. The cargo craft was released on March 28.**

Station Program has maintained a liaison office at TKSC, responsible for providing administrative and technical support for NASA personnel on business in Japan and to help facilitate communication between the two space partners. More than 200 NASA engineers and scientists have visited Japan during the past year, and during the construction phase of the Kibo module, more than 1,000 visits took place.

Mark Hershey, NASA's liaison to JAXA, was also in Japan during the earthquake.

"When we feel an earthquake, it's usually not a big deal," Hershey said. "Earlier in the week, a 7.1 earthquake struck the area, but little, if any, damage was caused. The day of the big one, things were different. It rumbled in, and this one didn't drift back off. It just kept increasing."

Hershey immediately reached out to NASA personnel and family members.

"We didn't know what all it had done, nor did we know about the tsunami," Hershey said.

Cell phones didn't work, but email did, so he was able to account for all personnel in the area.

Hershey serves as a jack-of-all-trades of sorts for the station program's operations in Japan, along with the office's Administrative Assistant Yuri Tsuge, and helps NASA maintain a robust and healthy relationship with JAXA. Hershey recently helped negotiate agreements to send seven HTV resupply vehicles to the space station through 2015. Before HTV-2 launched to station in January, he ensured that cargo shipped from Kennedy Space Center didn't run into unforeseen issues getting into Japan. He also helped perform flight readiness tests to assess vibration levels that the unpressurized cargo palettes experience en route to the launch facility there.

Calvin Seaman, who was the station team's liaison to JAXA between December 2002 and early 2009, said a huge part of the job is making sure that NASA visitors are able to deal with the difficulties of foreign travel and can quickly adjust to Japanese customs and culture.

"A lot of the work we do there is taking care of our people," Seaman said.

For example, Seaman created flash cards with important sayings in English on one side, and the Japanese translations on the other side to help make sure nothing got lost in translation when a NASA traveler needed to get to the airport or ask a routine question.

The job helps make the international partnership work as effectively as possible.

"NASA has a great deal of experience, and we have a lot to learn from them to operate manned spacecraft," Toukaku said.

"We have a really good partnership on space station," Hershey said. "It's really significant because we're doing a very big project. It shows that even in an environment that needs precision, we're able to get it right."



**The Kibo Japanese pressurized module and Kibo Japanese logistics module are featured in this image photographed by an STS-124 crew member while Space Shuttle *Discovery* is docked with the station.**

NASA/PHOTO ISS027E008770

NASA/PHOTO STS124E007090

# International Space Station: Research out of this world

**For** more than a decade, the International Space Station has achieved continuous human occupation. Since the first crew arrived on Nov. 2, 2000, the orbiting outpost has been visited by 200 individuals from 14 different countries. Resident and visiting shuttle crew members have conducted groundbreaking research into the effects of long-duration spaceflight on the human body, which will help us understand complicated processes such as the immune system when planning for future exploration missions.

The station, including its large solar arrays, spans the area of a U.S. football field (including the end zones) and weighs about 45 tons. The complex now has more livable room than a conventional five-bedroom house, and has two bathrooms and exercise facilities. Its laboratories are kept busy with numerous, ongoing scientific experiments.

unique location in orbit and its significant power-generation capabilities, AMS-02 will help unlock the secrets of the universe.

A few additional experiments are highlighted here.

## Capillary Flow Experiment (CFE)—NASA

- Controlling the flow of fluids in the absence of gravity is a challenge for designing spacecraft liquid propellant, water and recycling systems.
- In space, liquids can climb container walls, making it hard to empty containers, measure the contents of storage vessels and obtain consistent performance in devices where liquids and vapor mix.
- Capillary fluid forces dominate. But instead of avoiding capillary flow effects, we should exploit them in an effort to control fluid orientation so that fluid systems on spacecraft perform predictably.
- The earliest capillary flow experiments on station produced the first ever space-validated models describing fluid behavior in space, leading to the development of open source software that can be used for reliably predicting fluid behaviors in that unique environment.
- This year, experiments are expanding to investigate capillary flow in more complex geometries to determine ideal tank designs for fluid systems in microgravity, as well as how water separates from gas, which is key for water purification on spacecraft.
- This research could also lead to models predicting fluid flows in porous media here on Earth, such as with ground water transport and in complex capillary structures like high-performance wicks for heat pipes employed in electronics cooling.



NASA/PHOTO ISS009E23445

**International Space Station Science Officer Mike Fincke in the U.S. Lab aboard station during Expedition 9 next to CFE-CL2.**

Expeditions 27 and 28 are taking advantage of a bonus storage and science facility, the Permanent Multipurpose Module, and will see the first movements of a human-like robot, Robonaut 2, in microgravity. These research and technology development activities will continue the transition of the station from construction site to full-time laboratory, putting the potential of space to work for the people of Earth.

Furthermore, the Expeditions 27 and 28 crews are working with 111 experiments involving some 200 researchers across a variety of fields, including human life sciences, physical sciences and Earth observation, and conducting technology demonstrations ranging from recycling to robotics. Seventy-three of these experiments are sponsored by NASA, including 22 under the auspices of the U.S. National Laboratory program, and 38 are led by international partners. More than 540 hours of research are planned—an average of almost 40 hours of research every workweek.

An important new instrument, the Alpha Magnetic Spectrometer-02 (AMS-02), was delivered to the station by the Space Shuttle *Endeavour* during STS-134. AMS-02 is a state-of-the-art particle physics detector constructed, tested and operated by an international team composed of 60 institutes from 16 countries and organized under the United States Department of Energy sponsorship. Taking advantage of the station's



NASA/PHOTO ISS027-E-007156

**European Space Agency astronaut Paolo Nespoli, Expedition 27 flight engineer, prepares to install Boiling eXperiment Facility hardware in the Microgravity Science Glovebox in the Destiny laboratory.**



By Neesha Hosein and Kelly Humphries

NASA/PHOTO ISS027ED17639



**NASA astronaut Ron Garan, Expedition 27 flight engineer, supports the CsPINs experiment in the Kibo laboratory of the station. The new JAXA life science experiment investigates how plants orient themselves for growth.**

### Boiling eXperiment Facility: Microheater Array Boiling Experiment (BXF-MABE)—NASA

- Boiling efficiently removes large amounts of heat by generating vapor from liquid; the bubbles transfer heat. On Earth, boiling is used in many processes as a way to efficiently transfer heat. For example, it is used in power plants to generate electricity. It is also used to keep refrigerators cool.
- An upper limit, called the critical heat flux, exists where a heater is covered with so much vapor during boiling that it prevents remaining liquid from reaching the heater. It's important to design boiling hardware according to the knowledge of its critical heat flux, since approaching the critical flux could stress and ultimately destroy the heater.
- In microgravity, because of the lack of buoyancy and convection, boiling happens in the form of one large bubble rather than the many small bubbles we see on Earth.
- Understanding the critical heat flux of this unique boiling in microgravity is important for designing optimal cooling systems for future space exploration vehicles.

### CSPINS-2

#### Dynamism of Auxin Efflux Facilitators, CsPINs, Responsible for Gravity-regulated Growth and Development in Cucumber-2—Japan Aerospace Exploration Agency (JAXA)

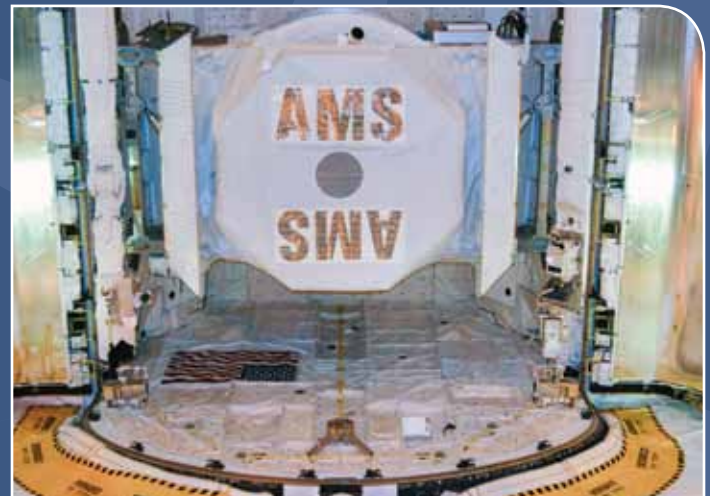
- Japan has implemented a new investigation on cucumber seedlings to study how plants sense gravity as an environmental signal and use it for governing their structural development and growth orientation.
- Dry cucumber seeds are launched in the chamber. They are imbibed and grown under either microgravity or 1 g conditions in the Cell

Biology Experiment Facility of the space station.

- Immediately after the incubation (22 to 72 hours), seedlings are fixed and refrigerated using the Kennedy Space Center Fixation Tube until recovery.
- Investigations of morphology and the expressions of CsPINs are done as postflight analyses.

### AMS-2

- **Antimatter:** All evidence currently indicates that the universe is made of matter; however, the Big Bang theory of the origin of the universe requires equal amounts of matter and antimatter. Whether there is significant antimatter is one of the fundamental questions of the origin and nature of the universe. Any observation of an antihelium nucleus would provide strong evidence for the existence of antimatter.
- **Dark Matter:** The visible matter in the universe, such as stars, adds up to less than five percent of the total mass of the universe, while the other 95 percent is composed of either dark matter or dark energy, which has been elusive to measure. One of the leading candidates for dark matter is the neutralino, a hypothetical particle that could be the stuff of dark matter. If they do in fact exist, they should be colliding with each other, giving off an excess of charged particles that can be detected by the AMS-2.
- **Strangelets:** A quark is an elementary particle and a fundamental constituent of matter. Six types of quarks have been found experimentally (up, down, strange, charmed, bottom and top), but all the matter on Earth is made up of only up and down quarks. It is a fundamental question whether there exists stable matter made up of strange quarks in combination with up and down quarks. This matter is known as strangelets. If detected by the AMS-2, the strangelet would be a totally new form of matter.
- In addition to measuring these particles in cosmic rays, the AMS-2 will provide accurate measurements of the radiation environment that will be beneficial in the development of radiation countermeasures for human exploration-class missions.



NASA/PHOTO JSC2011EO38986

**The AMS aft bulkhead after arms in launch position.**



By Debbie Nguyen

# Your NASA badge is **smarter** than you think

**Take** a good look at your NASA badge. The gold, grid-like square at the bottom isn't decoration, or flare. What you're looking at is a smart chip that contains your credentials electronically. Besides getting you through the front gates, your badge can also be used to access systems throughout NASA, and even at other federal facilities, without having to remember several different, complex passwords. With a smartcard, you just have to remember one six- to eight-digit Personal Identification Number (PIN).

The information stored on the chip includes: your badge holder unique identity, user PIN, Public Key Infrastructure (PKI) certificate and your biometric identification—or fingerprints. (It does not contain any privacy data.)

"A smartcard has been issued to all employees who require access to physical (buildings/facilities) and logical (Information Technology [IT]) at NASA," said Micheal Nevills, Johnson Space Center's lead for

needs updating. You can update your smartcard certificate in Building 110 or at your computer.

"It is important users update their smartcards when notified so they are prepared to use it when NASA and JSC begin enforcing the use of a smartcard for access to a JSC facility or IT system," Nevills said.

Smartcards are one step closer to modernizing physical access controls and are part of a larger program known as ICAM.

## I can with ICAM

"ICAM's overall goal is to enhance security, increase government efficiency, reduce identity fraud and protect personal privacy," Nevills said.

ICAM evolved from previous federal and agency initiatives such as the NASA Integrated Services Environment and external directives like the Homeland Security Presidential Directive-12.

Currently, you have to type in multiple passwords for multiple computers, and also have to go through different processes to access your IT account when you're at different centers. The agency is working to streamline access and minimize credential redundancies with the ICAM program:

**Identity:** Who are you?

**Credential:** How do you prove it?

**Access Management:** What can you use?

As stated in the agency's federal ICAM Roadmap, "As the federal government has refined its requirements for interoperability and portability regarding access to its physical and logical resources, NASA's ICAM Program will be refining its business and technical architecture accordingly. As NASA modifies its ICAM infrastructure, users can expect to see a required, rather than optional, use of their smartcard for access to facility and IT systems."

ICAM is jointly managed by NASA's Office of the Chief Information Officer and the Office of Protective Services.

For more information on ICAM, go to:

<http://insidenasa.nasa.gov/ocio/infrastructure/icam.html>

For more information on smartcards at JSC, go to:

<http://ird.jsc.nasa.gov/ComputerServices/smartcard/default.aspx>

NASA/PHOTO



NASA's Identity, Credential and Access Management (ICAM) and IT specialist with the Information Resources Directorate. "It is and will be required for access to all NASA IT and physical assets."

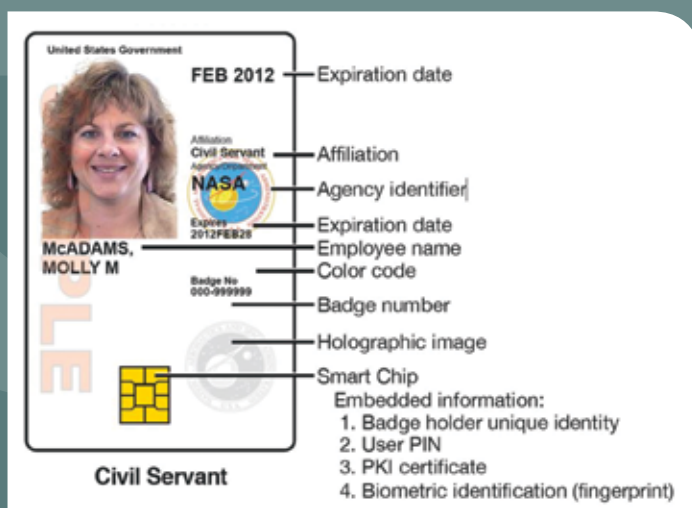
Benefits of using a smartcard:

- Minimizes the number of passwords to remember.
- Reduces the risk of identity theft by increasing protection of personal privacy.
- Provides strong authentication for higher-risk facilities and systems.
- Improves interoperability, supporting collaboration across the agency.

Some systems at JSC are already smartcard enabled. Many card readers are a slot embedded either onto your keyboard or the side of your laptop. In some cases, it's a separate device connected to your computer. Computers that have been smartcard enabled have been configured for "mixed mode" logon, which gives you the option of either inserting your smartcard and PIN or typing in your user ID and password. After you've logged in, don't forget to take your badge out. If you ever forget your PIN, you can visit Building 110 for assistance.

## Updating your smartcard

Your badge contains software, and it must also be updated periodically—at least once during its three-year lifetime. JSC team members will receive notification if their badge's smartcard certificate



# Space exercise: ARED supports crew health on station



By Neesha Hosein

**The** Advanced Resistance Exercise Device (ARED) is a piece of exercise equipment designed for use on the International Space Station. ARED was developed as a countermeasure against muscle atrophy and decreased strength and also protects against bone loss.

ARED has the capability to exercise all major muscle groups while focusing on the primary resistive exercise: squats, dead lifts and heel raises. ARED accommodates all crew members. Crew members use the device as part of their exercise routine, which involves about 2.5 hours of physical exercise each day.

## Goals and approaches

Bone and muscle strength are important for maintaining crew health and performance and ensuring success of things like planned and contingency spacewalks; in-orbit, off-nominal event response; high-G force Soyuz return to Earth; emergency egress; and post-flight recovery.

From a space station perspective, these exercise countermeasures target the cardiac, pulmonary, muscular, skeletal, neural and vestibular systems.

ARED simulates the use of free weights on the ground. It provides both a constant load and an inertial load with resistive force generated by vacuum cylinders. The device offers 29 different exercise options (with a bar and cable).

## Capability

ARED's load is adjustable from zero to 600 pounds for bar exercises Maria Kissh and up to 150 pounds for cable exercises. It has a means of collecting and storing detailed exercise data such as load, stroke and repetitions performed. The information is stored for later download to the ground or access by the crew.

For the original low-gravity application, the device is required to simulate weight lifting in normal Earth gravitation and to be functional for



NASA/PHOTO ISS018E025461

**Astronaut Sandra Magnus, Expedition 18 flight engineer, exercises on the ARED in the Unity node of the station.**

15 years. Major subsystems of the ARED are as follows:

- **Frame-and-platform assembly:** This represents a backbone that supports all other subsystems and components of the device.
- **Vacuum cylinders:** These provide constant resistance for exercise and are connected to the frame-and-platform assembly and the arm base assembly.
- **Arm base assembly:** This is part of the overall load path and serves as a load adjustment mechanism.
- **Wishbone arm/lift bar:** This part acts as the bar exercise interface and allows the user to perform the squat, dead lift, heel raise, along with many other exercises. This is also in the direct load path from the arm base assembly to the user.
- **Cable-and-pulley mechanism:** Connected to the arm base assembly, this is designed mainly to allow the user to perform long-stroke, low-load exercises, such as rows and arm curls.
- **Flywheel mechanism:** This provides the equivalent of the inertial component of free-weight exercise. The apparatus includes a gear rack attached to a piston shaft and meshes with a gear train connected to a flywheel. Movement of the lift bar, while in use, causes rotation of the flywheel.

## Display

ARED has a touch-screen display, which is used to access exercise prescriptions and to navigate through the various exercises. This allows the crew to monitor exercise progress.

## Where is ARED?

The device currently resides in Node 3 on station. It was launched on STS-126.



NASA/PHOTO S130E007098

**Pilot Terry Virts uses the ARED while Space Shuttle Endeavour remains docked with the station. Japan Aerospace Exploration Agency astronaut Soichi Noguchi, Expedition 22 flight engineer, is in the background.**



# Spotlight Art Knell

## Test Safety Officer, Anadarko Industries



PHOTO: COURTESY ART KNELL

### **Q: Coolest part of your job?**

**A:** Helping people. The look of surprise on people's faces when they realize the safety guy is being helpful is very satisfying. Sometimes they even voluntarily call back.

### **Q: Favorite hobbies or interesting things you do away from the office?**

**A:** Short- and long-distance paper punching, always involving firearms. I don't claim to be the best shot, but I have a lot of fun with both preparation (reloading) and shooting. I also enjoy photography, but am more a technical photographer than an artistic one. (If there is an artistic gene, I think it skipped me.)

### **Q: What was your first job (not necessarily at NASA, but ever)?**

**A:** Worked various jobs in a grocery store. I discovered my sense of humor isn't appreciated by many people. \*Sigh.\*

### **Q: If you could trade places with any other person for a week, famous or obscure, living or dead, real or fictional, who would it be?**

**A:** Why would I want to trade places with someone? I have the coolest job, am married to a great woman and have the best life I never even imagined possible.

### **Q: What is your favorite quote or motto?**

**A:** "Nothing is ever as good as or bad as it first appears." This quote was attributed to former Johnson Space Center Director Jefferson D. Howell Jr., and I've found it helpful to keep this in mind both on and off the job.

### **Q: What would we find in your refrigerator right now?**

**A:** Normal stuff: salsa, sauces and two bottles of wine. Long story, but the wines are anniversary wines, with the vintage from the year I got married.

### **Q: What is your favorite sport?**

**A:** Is reading a sport? I don't follow any sports and might see one football game a year.

### **Q: Last good book or article you read?**

**A:** "The Bedford Boys" by Alex Kershaw. This book documents the young men of Bedford who went to war. The D-Day Memorial is located in the town of Bedford because on June 6, 1944, Bedford had the highest number of men killed in action, per capita, of all the cities and towns in America. I gained a better appreciation of small-town life way back when, as well as the courage of men facing a task they knew they probably wouldn't survive.

### **Q: Favorite TV show and why?**

**A:** The weather report—any weather report. I don't watch much TV, as I prefer to read, but for some reason I am fascinated with the daily weather reports. The drama, the horror of it all. Will we ever get rain again? How much of my lawn can die and come back to life if it rains? (Now, we've had some rain, but I want more! Where's the rest of it?)

### **Q: Do you have any pets? If so, tell us about them.**

**A:** I don't suppose the dust bunnies under the workbench count.

### **Q: Describe yourself in three words.**

**A:** Sarcastic, obsessive-compulsive, but with a sense of humor.

### **Q: What direction would you like to see NASA take in the future?**

**A:** Any direction, just pick one!

### **Q: What is your best memory at NASA or JSC?**

**A:** Too many best memories to count! The people I get to work with are wonderful. (OK, maybe not everyone—you know who you are.) But the majority are great. Even better, as a test safety officer I'm always learning something new from these people.

## WANTED!

Do you know a JSC colleague or team that does something extraordinary on or off the job? Whether it's a unique skill, interesting work, special professional accomplishment, remarkable second career, hobby or volunteerism, your nominee(s) may deserve the spotlight!

The Roundup shines the light on one special person or team each month, chosen from a cross section of the JSC workforce. To suggest "Spotlight" candidates, send your nomination to the JSC Roundup Office mailbox at [jsc-roundup@mail.nasa.gov](mailto:jsc-roundup@mail.nasa.gov). Please include contact information and a brief description of why your nominee(s) should be considered.



## School science wing transforms into The Shannon Walker Science Satellite



NASA/MARKOWITZ JSC2011ED43988

Native Houstonian Shannon Walker gets star treatment from young fans at her alma mater, Johnston Middle School.

On May 6, NASA astronaut Shannon Walker stopped by her alma mater, Johnston Middle School in Houston, to visit with students and share her spaceflight experiences. Walker mingled and took pictures with students from the National Honor Society and other school organizations during a breakfast in her honor. She concluded her visit by giving a video presentation of her time in space to the entire Greyhounds' student body.

In appreciation of Walker's accomplishments, the school renamed their science wing "The Shannon Walker Science Satellite."

Walker served on Expeditions 24 and 25 to the International Space Station last year. She and her crew mates launched on June 10, 2010, aboard a Russian Soyuz spacecraft TMA-19. She returned to Earth as an Expedition 25 crew member when the crew's Soyuz capsule landed on Nov. 25, 2010. During her time in space, Walker and Expedition 25 Commander Doug Wheelock participated in a downlink with Johnston students.

## Have you had your 'Space Shuttle Experience' yet?

Before the Space Shuttle Program winds down for good, stop by and check out NASA's Space Shuttle Experience website at <http://shuttleexperience.nasa.gov/home.aspx>.

There you will find interactive activities to satisfy any aspiring explorer or space fan. Sign the Space Shuttle Program Tribute wall, catch up on the last missions, test your knowledge, see cool shuttle videos and much, much more. Kids even have their own "corner," where they can try their hand at designing a custom space meal. It's at your fingertips.



One of the Expedition 27 crew members aboard the International Space Station recorded this image of the Space Shuttle *Endeavour* as the two spacecraft made their relative approach on May 18. Each spacecraft was occupied by six crew members until the STS-134 astronauts entered the station following the docking.



NASA/PHOTO ISS027E032636

## A sight to have and to behold

While all of England (and much of the world) was abuzz with royal wedding fever, Flight Engineers Cady Coleman, Paolo Nespoli and Ron Garan sent a congratulatory message to the royal couple on behalf of the Expedition 27 crew.

You can view the video message here: [http://www.nasa.gov/multimedia/videogallery/index.html?media\\_id=84534921](http://www.nasa.gov/multimedia/videogallery/index.html?media_id=84534921)



NASA/PHOTO ISS006E22939

The city lights of London were captured with a digital still camera by one of the Expedition 6 crew members on station.

## Roundup

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# The lesson that lives on



By Catherine Ragin Williams

**The** Holocaust was so horrific, it is no wonder that many of us would rather just not think about the atrocities that occurred in the past. But remembering is necessary so that history is never repeated.

The Office of Equal Opportunity and Diversity invited Holocaust survivor Soula Molho, 87, to share her story with Johnson Space Center team members on April 28 in honor of the Holocaust Days of Remembrance. In addition, exhibits from the United States Holocaust Museum were on display.

Molho and her family were arrested because they helped hide American and British soldiers from the Nazis in Greece for one year during the Nazi takeover of her country. She was taken to the worst extermination death camp in Poland, but survived three long years of torment to later go on and share her story. During her talk, "Justice and Accountability in the Face of Genocide: What Have We Learned," Molho lamented the degrading of certain subsets of the human race during that time in history.

Of her own experiences with her Nazi captors, Molho said, "They never called me Soula. Never."

Molho was a number. One of many "numbers" who endured unspeakable horrors.

In sharing her personal account, Molho hopes to remind people that we must learn from the mistakes of humankind and not stand by in silence in the face of evil. We are equal to each other—and all deserving of respect and dignity.

**Top right:**

Soula Molho shared stories of her years at Auschwitz, a death camp in Poland.

**Bottom right:**

Molho receives a standing ovation from the packed house.



NASA/BLAIR JSC2011E039611



NASA/BLAIR JSC2011E039608